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2001:04

CANADA PLAN SERVICE

PROPER DISPOSAL OF DEAD POULTRY

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A practical and sanitary system for disposing of dead poultry will help you prevent the spread of disease, prevent odours and fly breeding, and meet provincial regulations for water and air pollution.

Most provincial regulations require that dead poultry be disposed of within 48 hours. Regardless of the method of disposal chosen, access to the carcasses by scavenger animals such as coyotes, dogs, birds, wolves and bears must be prevented.

Within the guidelines of these regulatory agencies, a disposal method that best fits the management system and location of the farm can be selected. The criteria a person should use to determine the most suitable disposal method needs to include:

- Compliance with local and/or provincial regulations
- Economics of each method
  - amount of mortality
  - capital costs
  - equipment availability
  - cost of labour
- Reliability of each method
- Degree of biosecurity

The pattern of mortality is also important. Carcass mass is fairly consistent in a breeder or layer operation but a growout operation will have increasing volumes as body size increases with age. Catastrophic losses can create havoc with any disposal method and alternative procedures should be in place in case of a severe disease outbreak or a management problem, such as ventilation failure which may cause high losses.

There are four disposal methods available to consider:

- Incineration
- Rendering
- Composting
- Burial on the farm

Incineration

This is perhaps the most common method of carcass disposal on poultry farms. It is relatively simple and very sanitary. The residue of properly incinerated poultry will not attract insects or rodents. Most poultry incinerators are efficient and can be licensed by provincial environmental agencies. Most provincial legislation requires that on-farm incinerators be licensed or at least registered. However, odours can be a problem if carcasses are not completely burned. Incinerators are also relatively expensive to buy and to operate. Units consuming 300 MJ, with a capacity of about 25 kg per hour are currently costing about $4,000. Table 1 gives the results of one study on fuel use for incinerators.

Table 1 Efficiency of Incinerators (*)

Species	Litres of propane/kg of carcass	m^3 of natural gas/kg of carcass
3-week old Broiler	0.54	0.37
7-week old Broiler	0.33	0.22
Broiler Breeder	0.30	0.20
Commercial Layer	0.27	0.18
Turkey	0.30	0.20

(*) Source: M.J. Winelard, T.A. Cortes and K.E. Anderson; "A Cost Comparison of Composting and Incineration as Methods for Mortality Disposal"; North Carolina State University; 1998.

Table 2 gives the approximate annual costs of operating an incinerator for various poultry operations.

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Table 2 Approximate Annual Operating Costs For Incineration (*)

	Natural Gas	Propane
Commercial Layer (100,000 birds)	$2685	$3320
Broiler Breeders (10,000 birds)	$2510	$3125
Broilers (100,000 birds/flock)	$5065	$7115

(*) Assumes capital cost of incinerator, concrete slab, and fuel service at $4560 (with a life expectancy of 10 years); fuel costs at $10.00/GJ for natural gas ($.48/litre for propane); labour at $9/hour.

Rendering

Delivery to, or having mortality picked up on a regular basis by a rendering plant is the easiest, lowest cost option for the management of deads. Proximity to a rendering plant, and the type and volume of carcasses will determine if this option is feasible. Check with your local rendering plant to determine if they can process feathers and if they are even interested in proceeding with this arrangement.

Carcasses have to be held in a leakproof, fly, and scavenger proof container that can maintain temperatures below 4.4°C (40°F) or below freezing. This usually means a refrigerator or deepfreeze on a concrete pad, accessible to the rendering truck for either manually transferring the deads, or having the container adapted to the truck's lifting mechanism. The main disadvantage is the potential spreading of disease as the truck travels from one farm to another.

Composting

Composting is a recent procedure developed for the disposal of poultry mortality. The method uses naturally occurring microorganisms (bacteria and fungi) to convert mortality and litter into a product which can be used as a fertilizer and soil amendment. The final composition of the compost can be highly variable, depending upon the management of the process. The basic requirements for successful composting are:

(a) A carbon to nitrogen (C:N) ratio of between 20:1 and 35:1 with the best ratios of 25:1 to 30:1. This is typically achieved by layering poultry mortality with manure and wheat straw or shavings (see: *Table 3 Mortality Composting Formula*).

(b) Providing a mixture moisture content of 50% to 60%.

(c) Monitoring the internal temperatures to ensure they reach 50°C to 65°C within 24 to 48 hours; turning the compost when internal temperatures fall (usually after 3 to 4 weeks), and transferring to the secondary bins for another 3 to 4 weeks.

Table 3 Mortality Composting Formula

Materials	Part by Weight
Dead chickens	1.0
Chicken manure	1.5 to 2.0
Wheat straw (or shavings)	0.1
Water	0 to 0.5

The recommended primary and secondary bin size is based on 62 Litres (0.062 m^3) per kilogram of average daily loss (1 cubic foot per pound of maximum daily mortality). Typical bin dimensions are: 1.5 m (5 ft) high; 1.5 m (5 ft) long and 2.1 m (7 ft) wide, or 0.6 m (2 ft) wider than the loader bucket. This size of bin will hold about 80 kg (175 lbs) of daily mortality. The number of primary bins required is equal to the daily maximum mortality divided by the bin capacity. For example, in a 100,000 bird broiler operation with a daily mortality of 0.125% (5% over 40 days) and a maximum bird weight of 1.9 kg (4.2 lbs), the daily mortality is:

100,000 x 1.9 x 0.0125 = 237.5 kg (525 lbs).

Since mortalities can occasionally be twice this high, the daily mortality could be 475 kg (1050 lbs). Thus, the suggested number of primary bins is:

475 kg ÷ 78.25 kg/day (1050 lbs ÷ 175) = 6.

The number of secondary bins is also 6, for a total of 12 bins.

Ideally, these bins are housed in a partially open front shed (facing south) with a concrete floor. A bird screen should be put on the open face. Any contaminated runoff must be collected, and surface water must be directed away from the composting facility.

The shed eliminates excess moisture from precipitation, excludes scavengers, and helps to reduce odour spread. Under proper management, only an "earthy" odour exists. Objectionable odours may result, due to inadequate aeration, a low C:N ratio, or wet composting materials.

Table 4 gives a rough estimate of the cost of building and operating a composting facility. It also gives an overall cost which takes into account the value of the compost as a fertilizer. No value is given for its benefit as a soil amendment.

Table 4 Approximate Annual Operating Costs For Composting (*)

	In Composter	As Spread
Commercial Layer (100,000 birds)	$2910	$2430
Broiler Breeders (10,000 birds)	$2560	$2140
Broilers (100,000 birds/flock)	$4810	$4100

(*) Assumes capital cost of enclosed (open front) pole shed (with concrete floor); wooden plank primary bins; water service at $3700 for layers and breeders; $8600 for broilers (with a life expectancy of 25 years); labour cost at $9/hour; small loader tractor at $20/hour; straw at $22/tonne; compost hauling at $1.65/tonne, and compost fertilizer value at $31/tonne.

Burial (on-farm)

This was the common method of dead bird disposal, but with larger poultry flocks and an increased concern about groundwater pollution, this method is not recommended. If it is approved, the excavation must be in low permeability soils (less than 10^{-7} cm/sec); at least 1 m above the water table; and the mortality must be covered by at least 0.6 m (2 ft) of earth (1.2 m (4 ft) in some jurisdictions). Winter operation is very marginal unless the clay back-fill was very dry or stored in a heated shed. Lime is often added to the layer of carcasses before being covered.

Burial might be considered for a catastrophic death loss (e.g., power failure), assuming soil conditions are favorable.